

WHAT IS CLAIMED IS:

1. A flush valve assembly for a water tank of a toilet, comprising:

5 a valve body, said valve body including a base portion that is secured to said water tank, and a first cylindrical tube member that extends longitudinally upward from said base portion along a longitudinal axis of said valve body, wherein said first cylindrical tube member is concentrically defined relative to an annular support that supports an annular insert thereon and an annular base adjacent said base portion;

10 a flush cover member having a predetermined length, said flush cover member being coaxially and slidably mounted with respect to said valve body so as to create a valve opening therebetween when said flush cover member is removed from said valve body; said flush cover member being slidably movable between a first rest position, wherein said flush cover member is
15 seated on an inner peripheral flange member of said base portion of said valve body to obstruct fluid flow through said valve opening, and a second position, wherein said flush cover member is removed from said inner peripheral flange member to allow water to pass through said valve opening; and

20 guiding means for properly guiding and aligning said flush cover member with respect to said valve body when said flush cover member is moved between said first and second positions;

wherein said guiding means includes a second cylindrical tube member secured to said flush cover member which is slidably fitted over said first cylindrical tube member so that said
25 flush cover member is properly guided and accurately aligned with said valve body when said flush cover member is moved between its said first and second positions; said guiding means further including at least one alignment tab on said flush cover member that remains in sliding engagement with at least one corresponding tab recesses defined in said valve body so as to enable longitudinal and central alignment of said flush cover member relative to said valve body;

2. The flush valve assembly of claim 1, wherein second cylindrical tube member, together with a downwardly depending vertical wall, defines a flotation cavity in said flush valve cover.

5 3. The flush valve assembly of claim 1, wherein said flush cover member includes means for restricting upward backflow migration when said flush cover member is initially moved from said first rest position to said second position.

10 4. The flush valve assembly of claim 3, wherein said backflow restriction means includes an annularly inclined baffle member extending from an inner peripheral surface of said flush cover member.

5. The flush valve assembly of claim 1, further including a secondary float assembly pivotably affixed to said valve body.

15 6. The flush valve assembly of claim 5, wherein said secondary float assembly includes a flotation cup having a wall defining the periphery thereof and a flotation cavity therewithin; and a resilient member integral with said flotation cup, wherein said resilient member engages one of a plurality of ratcheted teeth provided on a cantilever portion of a pawl member in communication therewith.

20 7. The flush valve assembly of claim 6, wherein a recess is defined along a length of said wall adjacent said pawl member so as to receive a flange portion thereof and effect securement of said flotation cup and said pawl member to one another.

25 8. The flush valve assembly of claim 6, wherein said pawl member further includes retention members in combination with each of a primary finger and a secondary finger that engage said flush cover member during reciprocating movement thereof.

30 9. The flush valve assembly of claim 8, wherein said flush cover member includes an integral tab portion along an outside peripheral surface thereof that engages at least one of

said primary finger and said secondary finger when said flush cover member moves between its first rest position and its second position.

10. The flush valve assembly of claim 5, wherein said secondary float assembly
5 communicates with said valve body and said flush cover member via engagement of said secondary float assembly with a portion of said valve body.

11. The flush valve assembly of claim 1, further including a flush lever displaceable
by a user between a first rest position and a second position to operatively move said flush cover
10 member between its first rest position and its second position, respectively.

12. The flush valve assembly of claim 11, wherein said flush valve assembly further
includes trip release means for releasing the effect of said flush lever on said flush cover member
when said flush cover member reaches its second position so as to return to said flush cover
15 member to its first rest position prior to said flush lever returning to said first rest position thereof.

13. The flush valve assembly of claim 12, wherein said trip release means is a trip
release mechanism coaxially mounted with respect to said valve body and said flush cover
20 member, said trip release mechanism including a cam rod; a pull rod operatively connected to said flush lever and slidably mounted with respect to said cam rod so that said pull rod and said cam rod are movable in response to movement of said flush lever; and a trip dog assembly including means for engaging said flush cover member when said pull rod and cam rod are moved between a first rest position and a second predetermined position, and means for
25 disengaging said flush cover member when said pull rod moves beyond its second predetermined position; wherein said cam rod of said trip release mechanism is mounted within said first cylindrical tube of said valve body; and wherein said first cylindrical tube me of said valve body includes an inwardly extending annular flange member to restrict movement of said cam rod past its second predetermined position.

14. The flush valve assembly of claim 13, wherein said flush cover member engaging and disengaging means of said trip dog assembly includes at least one wing-like retention member that extends outwardly to engage said flush cover member when said pull rod is moved between its first predetermined position and its second predetermined position to move said flush cover member between its first rest position and its second position, and which retracts when said pull rod is moved past said second predetermined position, disengaging said at least one wing-like retention member from said flush cover member so as to allow said flush cover member to return to its said first rest position.

15. The flush valve assembly of claim 14, wherein said at least one wing-like retention member is engaged with the annularly inclined baffle member of claim 4 when said pull rod is moved between its said first rest position and its second predetermined position.

16. The flush valve assembly of claim 15, wherein said at least one wing-like retention member is retracted when said pull rod is moved past its second predetermined position, thereby disengaging said at least one wing-like retention member from said annularly inclined baffle member to thereby allow said flush cover member to return to its first rest position.

17. The flush valve assembly of claim 14, wherein said at least one wing-like retention member is engaged within a central depression section of said cam rod so as to cooperatively move said cam rod and said pull rod between their said first and second predetermined positions.

18. The flush valve assembly of claim 14, wherein said second cylindrical tube of said flush cover member has an annular flange on an end thereof that repositions said at least one wing-like retention member to an extended engageable position when said cam rod and said pull rod are returned to their first rest position to properly align said flush cover member with respect to said valve body during movement of said flush cover member between its first rest position and its second position.

19. The flush valve assembly of claim 13, wherein said pull rod is spring-loaded with respect to said cam rod.

20. The flush valve assembly of claim 19, wherein said flush lever is operatively
5 connected and slidably mounted with respect to said cam rod so that said pull rod and said cam rod are moveable in response to movement of said flush lever.

21. The flush valve assembly of claim 1, wherein said flush cover member further
10 includes at least one damper tab disposed along an outer circumferential periphery of a lower portion thereof.

22. The flush valve assembly of claim 1, wherein said valve body is secured to said tank
15 by one or more fasteners inserted through corresponding apertures provided along an outer peripheral extent of said base portion.

23. The flush valve assembly of claim 1, wherein said valve body further includes a
plurality of support members distributed generally circumferentially around a periphery of said
valve body defined by relative placement of said annular support and said annular base..

24. The flush valve assembly of claim 1, further including a sealing member provided
20 adjacent said valve body so as to abut said base portion and thereby seal said flush valve assembly with said tank.

25. The flush valve assembly of claim 1, wherein said flush cover member includes a
25 funneled inlet at a flush water inlet orifice, said funneled inlet having a predetermined lead-in angle relative to the horizontal axis of said flush cover member.

26. The flush valve assembly of claim 1, wherein said flush valve cover includes an
annular sealing member having a lip that rests on said inner peripheral flange member defined
30 along an inner circumferential surface of said valve body when said flush cover member is in its first rest position.

27. The flush valve assembly of claim 26, further including an O-ring in communication with said annular sealing member.

5 28. The flush valve assembly of claim 12, further including a baffle cup having an outer periphery that defines a float cavity therewithin and having at least one aperture provided therethrough to establish communication among said flush lever, said baffle cup and said trip release means.

10 29. The flush valve assembly of claim 1, wherein said valve body includes means for minimizing flow resistance.

15 30. The flush valve assembly of claim 29, wherein said flow resistance minimization means includes a plurality of tapered web members radially disposed between said first cylindrical tube member and said base portion.